REMARKS

The specification has been amended at page 2, line 12 to correct a typographical error. The □s were inadvertently inserted into the familiar anodization chemical reaction equation in place of the directional arrows. The first arrow indicates the direction of the indicated reaction and the second and third arrows indicate that oxygen and hydrogen are evolved as gases.

Claims 2, 4 and 7 have been amended to more clearly state the invention therein. It is believed that these amendments meet the Examiner's rejection of Claims 2-4 and 7 under 35 U.S.C. §112, second paragraph. The Examiner is respectfully requested to reconsider her rejection of these claims on this ground.

Claims 1-4 and 7 are rejected under 35 U.S.C. §103 (a) as being unpatentable over Sekinger et al, U.S. Patent 5,975,976. The Examiner is respectfully requested to reconsider this rejection for the following reasons.

Claims 1-4 recite methods for forming a bright anodized coating on a surface of an aluminum alloy article when the alloy contains more then 3% by weight magnesium. As clearly taught in the specification, the purpose of forming such a clear and bright aluminum oxide coating is so that the coating can be colored by one of several known chemical or electrochemical practices to produce a commercially acceptable surface finish. These are coloring processes for suitably anodized surfaces that are different than simply painting over the surface.

Claims 5-7 recite methods of making a body component for an automotive vehicle where the component is formed from a sheet of aluminum alloy containing more then about 4% by weight magnesium. These aluminum alloys can be processed as described for high elongation forming processes useful for automobile body panels. But, unfortunately, these compositions previously could not be anodized to a clear aluminum oxide coating for decorative coloring. The methods of claims 5-7 comprise forming the sheet into a body component having a surface requiring a decorative finish and then treating the surface of the sheet to produce an anodized surface that is suitable for the decorative finish. In accordance with claim 5 and its dependent claims 6 and 7, the surface of the body component ends up with a clear coating of aluminum oxide having a thickness of about 10-25 micrometers.

Claim 1 specifies a method for anodizing such magnesium containing aluminum alloys in aqueous sulfuric acid of specified concentration and at a temperature and current density productive of a clear anodized layer suitable for color finishing. Dependent claim 2 specifies that the anodizing be conducted at 18 to 25 C (i.e. ambient temperature or lower) and at a low current density of three to ten amperes per square foot. Dependent claim 3 specifies an acid treatment to precede the anodizing step of claim 1 or 2 for the purpose of reducing the magnesium content of the surface of the aluminum alloy article. Dependent claim 4 specifies that the magnesium reducing reaction of claim 3 be conducted electrolytically. The specification teaches (pages 8-11) with reference to Figures 1 and 2 that a suitably low current density is important to obtaining a clear coating with good gloss.

Independent claim 5 specifies a process of making a body component for an automobile from magnesium containing, aluminum alloy sheet metal. The sheet metal is formed into the part shape and the surface is anodized in aqueous sulfuric acid (100-200 g of acid / liter of bath) at 18 to 25 C and a current density of three to ten amperes per square foot of surface. Dependent claims 6 and 7 specify the magnesium reducing treatments of claims 2 and 3.

Applicants' specification at pages 1-3 describe prior art practices of anodizing aluminum alloys to produce adherent, oxide coatings for coloring to decorative finishes. The actual experience of those skilled in the art is that they have been unable to produce clear anodized coatings for decorative coloring when the aluminum alloy contains more then about 2-3% by weight of magnesium.

As further evidence of the state of the art of producing clear anodized coatings for subsequent coloring, applicants submitted the Powers et al U.S. Patent 4,601,796, the Timm et al U.S. Patent 4,806,211 and page 276 from chapter 7 of the 1987 edition of <u>The Surface Treatment and Finishing of Aluminum and its Alloys</u> by Wernick et al.

The 1987 Wernick et al text states that anodizing can give clear colorless coatings for aluminum alloys having up to 3% by weight magnesium. The Powers et al patent complements the text material. Powers teaches that a highly reflective anodized aluminum alloy product can be made containing up to about 1.5% by weight magnesium. In anodizing such 1.5% Mg content aluminum alloys use a sulfuric acid anodizing bath at

a current density of 18 to 72 amperes per square foot of surface. Thus, their process for low magnesium, aluminum alloys uses a much higher current density than contemplated by applicants' claimed processes (see claims 2-7).

The Timm, et al patent states that aluminum alloy product with a uniformly grey surface is produced when the aluminum alloy contains iron and up to 5% magnesium. The gray color tone on the aluminum alloy does not "require" additional adsorptive coloring because the gray tone of the anodized coating distorts any attempts to further color the surface. The Timm, et al process uses a sulfuric acid-oxalic acid bath with a first stage direct current density of 100-200 A/m^2 (9.3 to 18.6 A/ft^2) and a second stage alternating current density of 10-150 A/m^2 (0.9 to 14 a/ft^2). But applicants didn't want a grey anodized coating. A clear coating is required for aluminum oxide coloring of choice.

Accordingly, these prior art publications describe the state of the art confronted by applicants when they sought to produce colored anodized surfaces on high magnesium content aluminum alloys. It is these high magnesium content alloys that have provided the excellent formability useful in the manufacture of automotive body components, such as, deck lid panels, tail gate panels and the like. But the formable alloys have been difficult to anodize and color.

Clearly, the practices of prior art related to making colored anodized surfaces on magnesium containing aluminum alloys is not duplicative of applicants' claimed processes.

In her rejection of Applicant's claims, the examiner has chosen to ignore the prior art as reflected in the Powers et al patent, Timm et al patent and Wernick, et al prior art publication submitted by the applicants. The examiner relies on Sekinger et al U.S. 5,975,976 which has nothing to do with producing colored anodized aluminum. Sekinger et al seek to produce a structured metal surface with peak shaped finger-like elements for a high yield of electrons in field emission screens for electronic devices. In order to make the metal surface with peaked shaped elements for electron emission Sekinger et al use an anodized aluminum surface as a mold. The anodized mold is to have pores 50 nm to 20 μm deep, preferably 0.5 to 3 μm deep.

Sekinger et al are wholly unselective in choice of aluminum mold material or anodizing process. They can use virtually any aluminum composition from substantially pure aluminum to any known aluminum alloy. High magnesium content aluminum alloys are suitable for the purpose. But the focus of the Sekinger et al process is simply to produce an anodized aluminum layer on any aluminum body with the result that the aluminum oxide columns define a mold structure suitable for subsequent infiltration with a metal. The major portion of the aluminum oxide material is then etched away. In effect the anodized surface of the aluminum is gone leaving the metal electron emitting surface sought by Sekinger et al.

The Sekinger et al mold making process can use any anodizing practice as seen at column 6 of that patent. The anodizing voltage can be from 10 to 100V and the current density can be from 100 to 3000 A/m^2. Any strong organic and/or inorganic acid can be used. Several acids are identified as useful. Obviously, Sekinger find no difficulty in producing an anodized aluminum surface that is suitable for their mold structure. But they teach nothing about making a clear anodized coating on a high magnesium content alloy for automotive finishes. In no realistic sense can applicants' claimed invention be considered "duplicative" of the Sekinger, et al encyclopedic disclosure for mold making.

The Examiner acknowledges that Sekinger nowhere teaches or suggests how to produce a clear anodized layer suitable for color finishing. Still the Examiner boldly and confidently states that Applicants' claimed invention would be obvious. The Examiner asserts that workers skilled in the art would know how to select from the very broad Sekinger disclosure of anodizing practices for mold making to identify just those low current density practices identified in claims 1-7 for producing a clear anodized layer suitable for color finishing. There is nothing that is critical or selective in the Sekinger anodizing process.

The Examiner's position seems to be that one skilled in the art would painstakingly try every Sekinger bath composition, voltage, current density and the like until the found the processes specified by applicants' claims 1-7. This is not a proper basis for a rejection under 35 U.S.C. 103. Such testing could take forever. Furthermore there is no suggestion in Sekinger that anything in that disclosure would be helpful in making a clear anodized layer on a high magnesium content alloy.

The Examiner's confidence in the Sekinger et al patent is contrary to the actual teachings of prior art related to making clear coatings on Mg containing aluminum alloys. One skilled in the art would be familiar with the Powers et al U.S. Patent 4,601,796, the Timm et al U.S. Patent 4,806,211 and page 276 from chapter 7 of the 1987 edition of The Surface Treatment and Finishing of Aluminum and its Alloys by Wernick et al. These prior art processes don't teach applicants' claimed processes and they overlap with Sekinger. The Examiner hasn't explained how one skilled in the art could struggle through all of these prior art disclosures to arrive at the processes specified in claims 1-7. The case citations relied on by the Examiner have not addressed any of these issues.

Accordingly, it is respectfully requested that the rejection of claims 1-4 and 7 be reconsidered.

Claims 5 and 6 are also rejected under 35 U.S.C. as being unpatentable over the same Sekinger reference. Again, the basis of the examiner's rejection is that Sekinger teaches a method of making a component, actually a mold, and that the component has an anodized aluminum surface. But applicants' claims 5 and 6 clearly recite a method of making a body component for an automotive vehicle. When the component is formed of aluminum alloy sheet material containing more then about 4% by weight of magnesium and the body component has a surface requiring a decorative finish. Applicants then recite a method that can produce a clear coating of aluminum oxide having a thickness of 10-25 micrometers on the surface of the body component so that the decorative finish can be formed. Applicants' arguments with the rejection of claims 1-4 and 7 are applicable here.

Sekinger doesn't produce a body with a decorative finish, he produces a mold structure. There is absolutely nothing in the entirety of the Sekinger et al disclosure that would enable anybody to produce a decorative clear aluminum oxide coating on a high magnesium content alloy. The Examiner's assertions with respect to the Sekinger et al patent fly in the face of the actual teachings and experience of those skilled in the art of making decorative anodized aluminum components. Accordingly, it is respectfully requested that the rejection of claims 5 and 6 be reconsidered.

It is also respectfully requested that the rejection of all the claims in the case be reconsidered and that they be allowed and that this case pass to issue.

Respectfully Submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

Page 2, line 12:

$2Al + 5\ H_2O\ [\square] \rightarrow Al_2O_3 + O_2\ [\square]\uparrow + 5H_2[\square]\uparrow$

In the claims:

2. (Amended) A method as recited in claim 1 in which said anodizing is conducted at a said temperature that is in the range of 18 to 25°C and at a said current density that is in the range of about 3 A/ft^2 to no more than 10 A/ft^2.

4. (Amended) A method as recited in claim 3 further comprising, during said immersing step, establishing said surface as an anode in a direct current circuit with said solution as [the] an electrolyte and applying a direct current voltage of [(]10 to 25 [V)] volts to said surface.

7. (Amended) A method as recited in claim [3] 6 further comprising, during said immersing step, establishing said surface as an anode in a direct current circuit with said solution as [the] an electrolyte and applying a direct current voltage of [(]10 to 25[V)] volts to said surface.